

What is claimed is:

1. A liquid crystal display comprising:

a light source made of a plurality of light emitting tubes each having one or more kinds of phosphors, and having a turned-on state and a turned-off state within one frame; and

a liquid crystal panel for adjusting the amount of light transmitted from said light source;

wherein a luminance factor area of light from each of said phosphors or a change in luminance factor per time of said light is substantially equal to that of light from any other phosphor in at least one of a luminance rise time when said light source changes from said turned-off state to said turned-on state and a luminance fall time when said light source changes from said turned-on state to said turned-off state.

2. A liquid crystal display according to Claim 1, wherein said light source is made of light emitting tubes of one kind, and each of said light emitting tubes is a multicolor light emitting tube having three or more kinds of phosphors.

3. A liquid crystal display according to Claim 1, wherein luminance of said phosphors is controlled by a current value of a current applied to each of said light emitting tubes.

4. A liquid crystal display according to Claim 3, wherein

at the beginning of said luminance rise time, said current value of said current applied to said light emitting tube is a current value I_2 not smaller than a current value I_1 necessary for said phosphors to emit light with predetermined luminance in one frame.

5. A liquid crystal display according to Claim 4, wherein a time Δt_{0D} when said current value I_2 not smaller than said current value I_1 necessary for said phosphors to emit light with said predetermined luminance is applied to said light emitting tube, a ratio N of said current value I_2 to said current value I_1 , and a rise response time τ_{on} of a fastest luminance response phosphor of said phosphors belonging to said light emitting tube, satisfy a relationship of Expression 1:

$$\Delta t_{0D} \leq \{-\tau_{on} / \ln 10\} \times (1 - 1/N) \quad \dots (\text{Expression 1})$$

where $N = I_2 / I_1$.

6. A liquid crystal display according to Claim 5, wherein said ratio N of said current value I_2 to said current value I_1 is larger than 1 and smaller than 6.5.

7. A liquid crystal display according to Claim 2, wherein a current value of a current applied to each of said light emitting tubes is increased stepwise in said luminance rise time.

8. A liquid crystal display according to Claim 7, wherein

a step time width Δt_{step} of said current whose current value is increased stepwise is set to be shorter than a luminance rise response time of a slow luminance response phosphor of said phosphors and to be longer than a luminance rise response time of a fast luminance response phosphor of said phosphors.

9. A liquid crystal display according to Claim 2, wherein a current value of a current applied to each of said light emitting tubes is attenuated stepwise in said luminance fall time.

10. A liquid crystal display according to Claim 9, wherein a step time width Δt_{step} of said current whose current value is attenuated stepwise is set to be shorter than a luminance fall response time of a slow luminance response phosphor of said phosphors and to be longer than a luminance fall response time of a fast luminance response phosphor of said phosphors.

11. A liquid crystal display according to Claim 1, wherein said light source is made of light emitting tubes of at least two kinds, and each of said light emitting tubes is a multicolor light emitting tube having at least two kinds of phosphors.

12. A liquid crystal display according to Claim 1, wherein said light source is made of light emitting tubes of at least two kinds, and at least one of said light emitting tubes is a unicolor light emitting tube having only one kind of phosphor.

13. A liquid crystal display according to Claim 1, wherein said light source is made of light emitting tubes of at least three kinds, and each of said light emitting tubes is a unicolor light emitting tube having only one kind of phosphor.

14. A liquid crystal display according to Claim 11, wherein at least two kinds of phosphors belonging to one and the same tube of said multicolor light emitting tubes have a substantially equal luminance rise response time and a substantially equal luminance fall response time.

15. A liquid crystal display according to Claim 12, wherein at least two kinds of phosphors belonging to one and the same tube of said multicolor light emitting tubes have a substantially equal luminance rise response time and a substantially equal luminance fall response time.

16. A liquid crystal display according to Claim 1, wherein luminance of said phosphors is controlled by a current value of a current applied to each of said light emitting tubes.

17. A liquid crystal display according to Claim 16, wherein a current value of a current applied to each light emitting tube having a fast luminance response phosphor is increased gradually in said luminance rise time.

18. A liquid crystal display according to Claim 16, wherein

at the beginning of said luminance rise time, said current value of said current applied to each light emitting tube having a fast luminance response phosphor is a current value I_2 not smaller than a current value I_1 necessary for said phosphors to emit light with predetermined luminance in one frame.

19. A liquid crystal display according to Claim 16, wherein said current value of said current applied to each light emitting tube having a fast luminance response phosphor is attenuated gradually in said luminance fall time.

20. A liquid crystal display according to Claim 16, wherein in said luminance rise time and a lighting period, a current value of a current applied to each light emitting tube is changed like a rectangular shape so as to drive said light emitting tube.

21. A liquid crystal display according to Claim 20, wherein in said current having a current value changed like a rectangular shape, a time width of said rectangular current value immediately after start of application of said current is longer than a time width of said rectangular current value immediately before termination of application of said current.

22. A liquid crystal display according to Claim 20, wherein a time width of said rectangular current value is not longer

than 3.3 msec.

23. A liquid crystal display according to Claim 16, wherein in said luminance rise time, time of start of application of a current to each light emitting tube having a fast luminance response phosphor is controlled to be delayed by a predetermined time Δt_i with respect to time of start of application of a current to each light emitting tube having a slow luminance response phosphor, so that a luminance factor area of said fast luminance response phosphor is substantially equal to a luminance factor area of said slow luminance response phosphor.

24. A liquid crystal display according to Claim 16, wherein in said luminance fall time, time of termination of application of a current to each light emitting tube having a slow luminance response phosphor is controlled to be delayed by a predetermined time Δt_f with respect to time of termination of application of a current to each light emitting tube having a fast luminance response phosphor, so that a luminance factor area of said fast luminance response phosphor is substantially equal to a luminance factor area of said slow luminance response phosphor.

25. A liquid crystal display according to Claim 24, wherein said luminance rise time and said luminance fall time are not longer than 3.3 msec.

26. A liquid crystal display according to Claim 16, wherein a luminance rise response time and a luminance fall response time of a slow luminance response phosphor of said phosphors are not longer than 3.3 msec.

27. A liquid crystal display according to any one of Claims 22 through 25, wherein said delay times Δt_i and Δt_f are almost half as long as a luminance rise response time and a luminance fall response time of a slow response phosphor of said phosphors respectively.

28. A liquid crystal display according to any one of Claims 22 through 26, wherein said delay times Δt_i and Δt_f are not longer than 1.7 msec.

29. A liquid crystal display according to Claim 1, wherein said phosphors are fluorescent materials to be excited by ultraviolet rays to thereby emit visible light.

30. A liquid crystal display according to Claim 1, wherein said light emitting tubes are cold cathode tubes.